

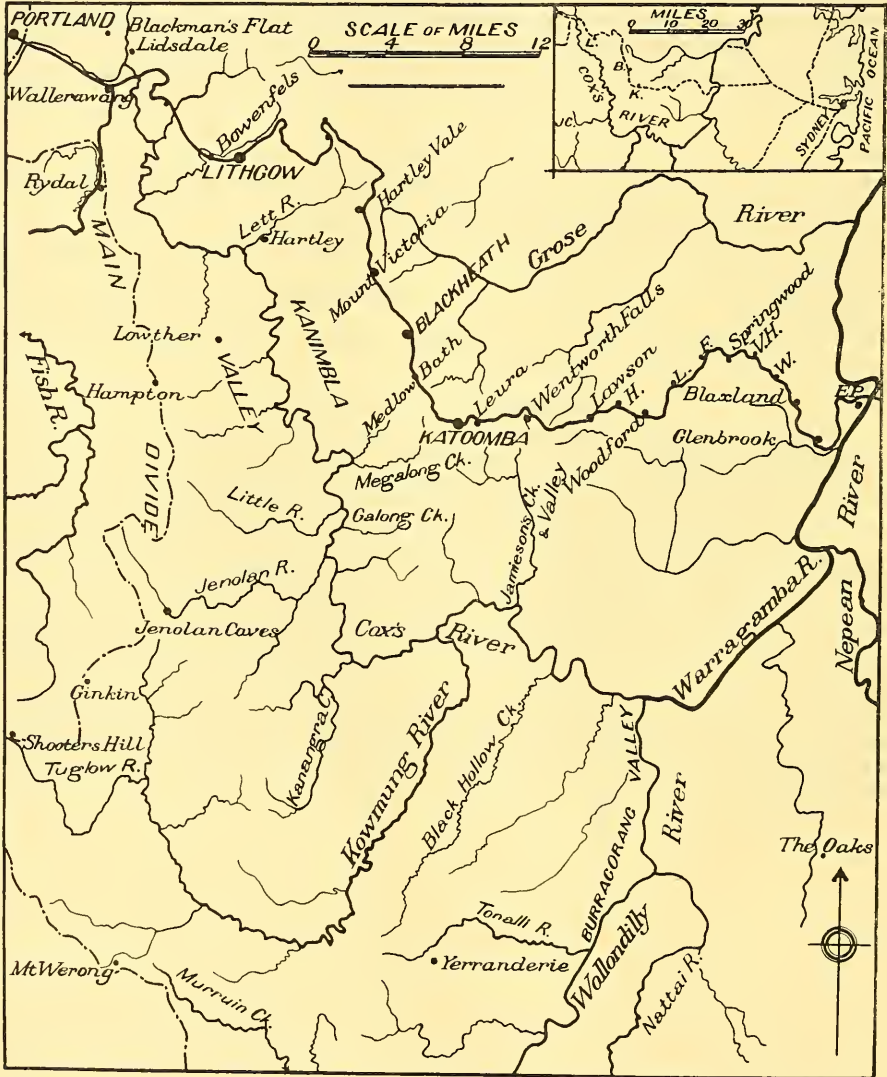
GEOGRAPHICAL STUDIES IN THE BLUE MOUNTAIN TABLELAND.

By FRANK A. CRAFT, B.Sc., Linnean Macleay Fellow of the Society in Geography, and formerly Caird Scholar in Geography, University of Sydney.

(Plate iii, and five Text-figures.)

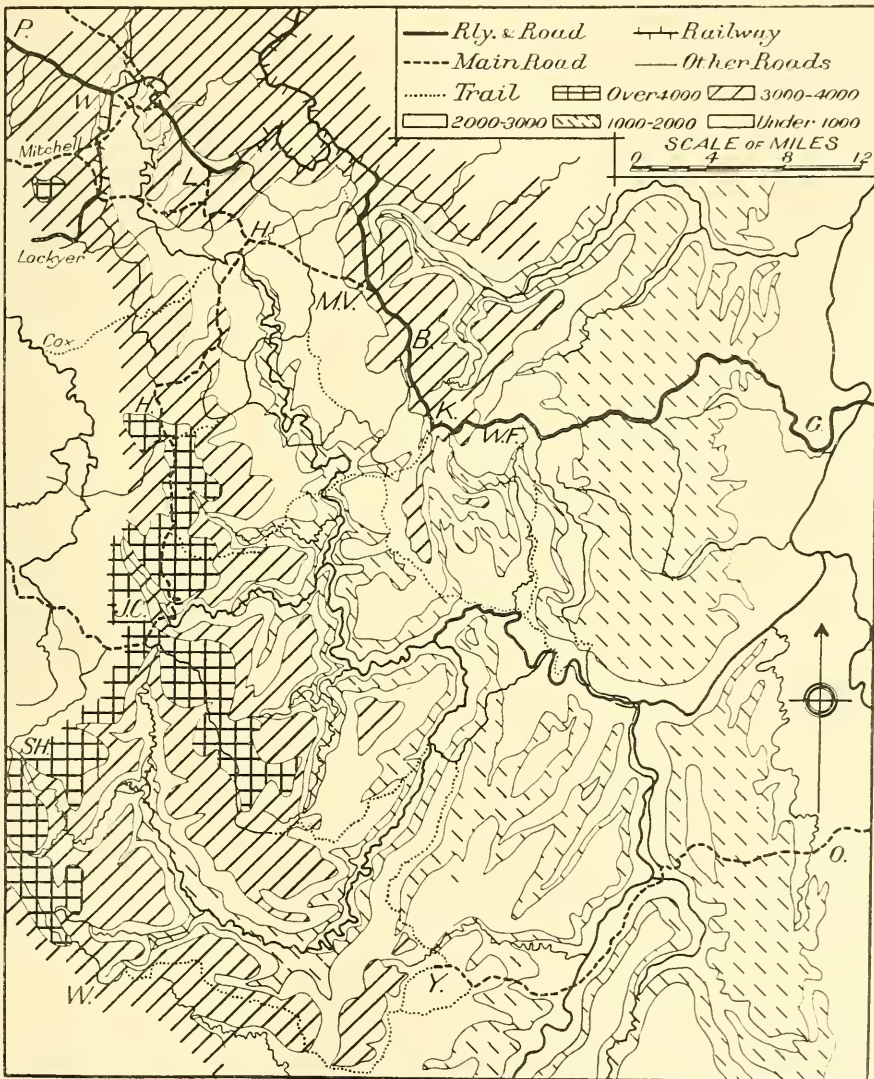
[Read 27th April, 1932.]

The Great Western Railway of New South Wales crosses the Blue "Mountain" Tableland, and along that part of its course is a series of towns and villages surrounded by wild and unoccupied country. Outposts of settlement are found in the



Text-fig. 1.—Locality Map of the Area. On the inset, broken lines indicate the principal railways.

less sterile parts of the highlands and in the valleys, but their people are isolated both in life and thought from those of the towns. In the succeeding pages I wish to examine the development and outlook of the various groups, and to make a series of studies in the geographical factors by which they have been most affected, beginning by considering the physical environment and the historical development of the settlements, and then going on to consider the life of the people in the less accessible parts.



Text-fig. 2.—Orographic Map of the Area. This shows also the means of communication and emphasizes the dependence of the various types upon topography.

*Physical Conditions—Topography, Soil and Climate. Text-fig. 2.*

The tableland rises gently westward from the Nepean River to an elevation of 3,500 to 4,400 feet, and there are extensive plains and slopes broken by deep valleys and gorges. In the north and east the plateau sandstone has been cut off sharply to form precipitous escarpments above the valleys, and the passage of these by roads and railways is a difficult and costly matter. Toward the south and west we find granite and folded rocks, but the absence of great lines of precipices is offset by the presence of narrow canyons, which the streams of an involved river system have eroded right to their heads. This compels land routes to keep close to the divides, although even there much difficult topography is encountered.

So far as climate is concerned, the area is essentially part of a unit in which the main differences are determined by altitude and distance from the sea. Increasing altitude gives an increasing rainfall from the foot of the eastward slope to its crest at Katoomba, but further inland the normal decrease again becomes apparent. The greatest precipitation is in summer, and there is a distinct minimum in spring, when the prevailing wind is from the west under conditions of rising temperature. The country above 2,800 feet is liable to experience snow in winter, but falls are few and light, and their effects disappear in two or three days. Frosts are experienced between May and October, so the cold climate fruits only can be grown successfully on the highlands, and destructive winds and hail in mid-summer may inflict severe damage on the ripening crop.

On the whole, the climatic differences from place to place are not sufficiently great to exert much influence on settlement or the utilization of the land, but they give local differences in crop types. Variations of soil, however, are of great importance, partly because of their control of plant growth, and partly on account of the water-holding capacities of different types of soil and topography. The plateau sandstones give a soil deficient in plant food, but of a high retentive value, and capable of holding much moisture. The granite soils of Kanimbla Valley are richer, but their porous nature and sharply undulating surfaces render them dry and generally unsuitable for cultivation. The clay soils of the high tableland about Jenolan Caves are more valuable, but here again much of the country is highly siliceous, or is steep and broken.

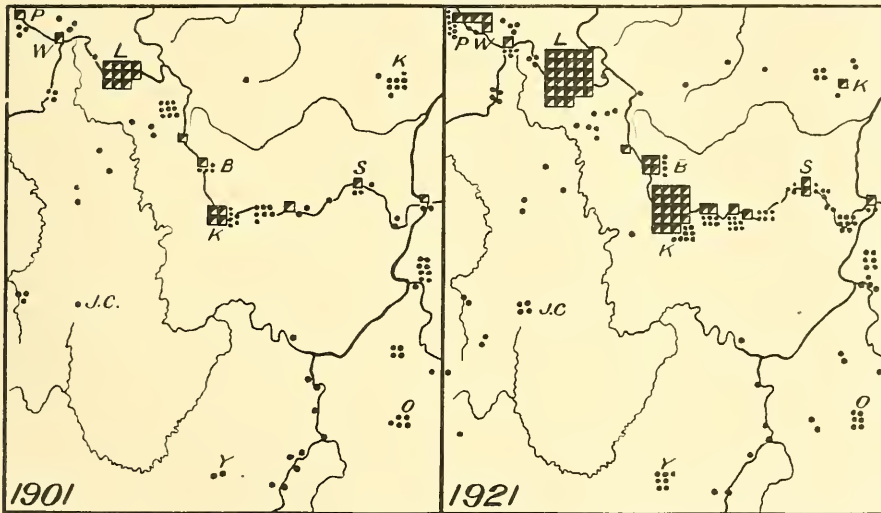
Taking the area as a whole, it gives little encouragement to settlers. It was originally covered with light eucalypt forest or scrub, part of which has now been cleared: it is greatly broken by precipices and gorges whose appearance is unfriendly and forbidding, and the more accessible streams cease to flow during very droughty summers. Apart from the railway towns, it has come to be a back-water between the more populous and productive districts about Sydney and Bathurst.

*Occupation of the Land.*

After the construction of Cox's road in 1815 from Sydney to the site of Bathurst, some 27 miles to the west of Rydal, a regular stream of traffic began to flow between the coast and the new inland settlements. The slow-moving bullock or horse teams required closely spaced halting places where water and grass were available, so inns and tiny hamlets came into being at such convenient places as Emu (Plains), Blaxland (originally "Wascoe's"), Springwood, Woodford

(Twenty-mile Hollow), Wentworth Falls (Weatherboard, later Brasfort), Mt. Victoria (One Tree Hill) and Hartley. This latter soon became an administrative post and a considerable centre, where laden teams from the west halted before commencing the arduous climb to "One Tree Hill". The pleasant slopes in this part of the Cox Valley were cleared and made productive, and settlement spread to Bowenfels, where there are still some stone houses built for the early colonial gentry.

In those early days of the colony, all building material had to be obtained locally, so the first constructions were of wooden slabs, "wattle and daub", or stone. This latter was used for government buildings or the homes of wealthier people, which were roofed with shingles or, later, with flat iron, whilst the houses of the poorer people were covered with the bark of the Stringybark (*Eucalyptus eugenioides* and *E. capitellata*), or, in some cases, with thatch. The settlers had to live on the country and use its resources for their homes and their living, the only alternative being to provide for the needs of travellers. Extensive settlement on the barren tableland between Glenbrook and Mount Victoria was



Text-fig. 3.—Distribution of Population. Each square represents 500 people, and each dot 50. "K" in the N.E. corner is Kurrajong.

impossible under such conditions, so the western edge of the shales of the Sydney Basin between Kurrajong, Emu Plains and The Oaks continued to mark the western limit of the first wave of settlement, whilst the second began about Hartley and had almost its whole development to the west of the Main Divide. The population maps still reflect these conditions.

*The Building of the Railway.* Text-figs. 3, 4.

The building of the Great Western Railway between 1867 and 1870 (to Bathurst in 1876) marked the beginning of considerable development in this area. As the small army associated with its construction passed on, individuals and groups were left in its wake for operating and repairing the track, and their isolated houses frequently marked the beginnings of later villages. But the greatest effect was felt in Lithgow Valley, where the line passed across the outcrop of

coal measures, whose importance as a possible source of fuel for the railway and more westerly towns was quickly realized. Commercial mining began in 1868 (see Carne, 1906), and about the same time the exploitation of lenses of "kerosene shale" occurring in the coal seams was begun at Hartley Vale. Exploration and testing were carried out along the whole outcrop, but with the exception of small coal and oil shale mines at Katoomba, nothing further was done to the south of Hartley Vale, partly on account of cliff barriers and costly haulage, but chiefly because of the marked deterioration of the coal seams. It is a fortunate coincidence that the railway should cross the best part of the outcrop in the shallow Lithgow Valley!

The inception of Lithgow and Katoomba, in particular, can be traced to the building of the railway. Most of the land along its course over the sandstone tableland was taken up by private speculators, and has gradually been subdivided into town and village sites as the occasion has demanded. This has given rise to a new type of settlement—one in which the people depend on wealth gained elsewhere, which enables them to live in retirement, or which is paid for service by those attracted to the tourist resorts that have been established to exploit climate and scenery. When the only means of transit was by road, the "Blue Mountains" were a toilsome interlude in the journey between Sydney and Bathurst; but when the railway brought them within easy reach of Sydney on the one hand, and the monotonous interior on the other, people began to visit them on account of their beauty of form and colour, and to seek relief in summer from the humid coast or the hot and dusty interior plains.

The two most obvious sites for settlements of such a nature are Katoomba and Blackheath, for in each case level country is available overlooking scenes of great beauty. By 1891 these had the respective populations of 1,590 and 770, whilst Mt. Victoria, with a considerable number of railway employees and miners, was rather smaller. During the next ten years (which included the depression of 1893), progress was slow. Blackheath and Mt. Victoria actually declined, but other settlements had sprung up—notably Lawson and Springwood—which rivalled all except Katoomba in size.

Here we have a second stage in the development of the tourist towns. More enclosed sites were now being occupied on the slopes, and commercial people from Sydney began to establish their homes or country houses in these resorts, dividing their favour equally between the nearer lower slopes and the more distant and picturesque settlements on the higher tableland. At the same time, these centres developed as holiday resorts, leading to the establishment of boarding-houses and hotels, the building of houses for seasonal occupation, and the growth of a population of artisans, tradesmen and others depending for a livelihood upon wealth gained by production or business elsewhere, but spent here. This is the distinguishing feature of a tourist resort, and its essential character as a non-producer of wealth is shown by its inability to maintain the natural increase of population when the tourist traffic no longer increases.

In the decade following 1901 the process of development accelerated, the most spectacular event being the rise of Leura (1,360 people—included with Katoomba on the maps), while Katoomba, Blackheath and Wentworth Falls showed respective increases of 1,680, 580 and 410. Mt. Victoria, however, fell below 500. We may generalize and say that the places with the greatest scenic attractions drew and held the greatest number of people—a condition which holds to the present

day, although the next decade saw a notable growth in the city-facing villages of Glenbrook, Springwood, Hazelbrook and Lawson. Since then there has been relatively little change, and a general condition of equilibrium seems to have been reached. It will be interesting to see how this condition has come about.

#### *The Tourist Resorts.*

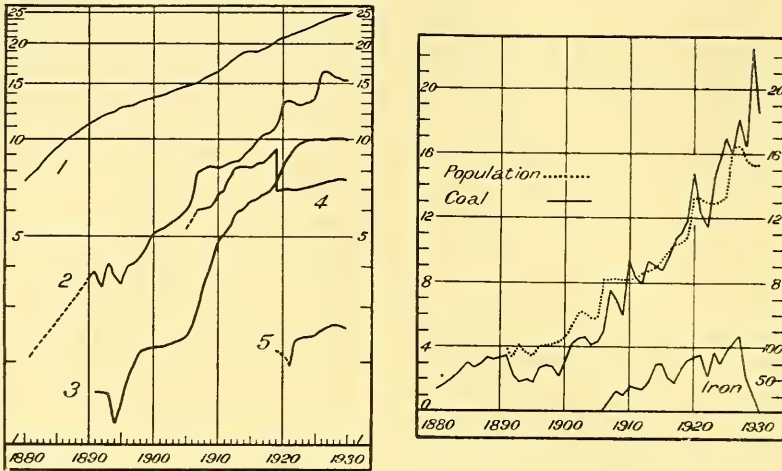
Katoomba was originally named "The Crushers", because rock breaking machinery was located there during the construction of the railway. From 1880 onwards small coal and oil-shale mines were worked beneath the cliffs immediately to the south, but exhaustion of the oil-shale lenses and a period of general depression caused the village to suffer a temporary setback, which was soon offset by new growth due to the increasing tourist traffic.

As we have already observed, the combined town of Katoomba and Leura has great natural advantages in site and aspect, and its central position gives it a superiority to rivals on either side, thus favouring a maximum of development. Seven years of relative inactivity ended in 1905, and were followed by five years of phenomenal growth. Although figures are not available, it is probable that the Blue Mountain Shire enjoyed a similar expansion of population three years ahead of the town, but their progress was similar from 1910 to 1913. By this latter year the wave of progress had spent its greatest force, and the uncertain years of the Great War are reflected in the population curves, although it is significant that Katoomba's advance continued, and accelerated during the post-war boom period—a movement which was not fully shared by the shire. After the ending of the boom about 1921, the rate of progress declined in both, and did not recover in the years of national prosperity between 1924 and 1928, although some such movement is found in the newly-formed municipality of Blackheath, and may have been present in individual villages of the shire.

What is the full explanation of these curves (Text-fig. 4), which differ materially from State conditions? The years 1902 to 1907 were marked by a great expansion in the State's trade, with the value of exports greatly exceeding that of imports. Mining and manufacturing were developing steadily, but the population of Katoomba showed no movement in sympathy with these factors. It would appear that, towards the end of this period, a people who had grown prosperous, but who were packed into a congested metropolis, began to realize the scenic and climatic advantages of the Blue Mountain Tableland, and a demand arose for those things. This had been largely satisfied before the war broke out, but it revived in 1917 and, after the close of the war, when a people released from that strain began to seek new diversions in places where they could be had with comparatively little restraint, they chose Katoomba rather than the smaller and more intimate towns of the shire. This was reflected in the increased popularity of dance halls and other places of amusement. The end of the post-war boom period had a marked effect upon the tourist traffic and the places living by it, but there was a more subtle change.

Had the simple economic factor prevailed, the succeeding years of prosperity would have caused marked rises in population, but, as it is, a decline was shown relative to the population of the State: the demand for these places has decreased, and they cannot support their natural increase of population. For this the motor car is largely responsible. Many of the city and inland people with money to spend—the class catered for by these towns—have become car owners,

and they are no longer compelled to spend their holidays in or near the railway towns. They are dispersed far and wide and the tourist resorts, deprived of many of their former supporters, have much difficulty in holding their own populations. There is, however, some compensation, as many people are taking advantage



Text-fig. 4.—Population Graphs. 1 = New South Wales (unit 100,000); 2 = Lithgow; 3 = Katoomba Municipality; 4 = Blue Mountain Shire; 5 = Blackheath Municipality, separated from B.M. Shire in 1919. Units for curves 2-5 are thousands. The vertical scale is logarithmic, and changes in equal proportion are parallel, irrespective of the actual numbers involved.

Text-fig. 5.—The Growth of Lithgow. Units refer to population in thousands, to coal in hundred-thousands of tons, and, in the bottom right corner, to the production of pig iron in thousands of tons. The coal production is for the whole of the Western field, for which see the text.

of the freedom of movement which the automobile gives, and are establishing their homes in the healthier tablelands away from the crowded metropolis. For climatic reasons also, small boarding-schools have come into existence in the larger centres, and sanatoria for the treatment of tuberculosis are found rather away from the most severe climate, the principal being at Wentworth Falls.

Summing up, we find that the tourist resorts exploit two great assets—climate and scenery—and they depend for their existence on the introduction of wealth created elsewhere. For some years the demand for their services has not increased, and their population shows a slight decline, which will probably continue.

#### *Lithgow.* Text-figs. 3-5.

While this process of development has been going on, Lithgow has had a different and an even more eventful history. Industry first came to the valley from the south, in the form of a small flour mill, established on Farmer's Creek (Coerwull Brook) in 1848, a water wheel being used to supply the necessary power. After ten years, the spinning and weaving of wool were substituted for the milling of wheat, but the water wheel, assisted by a steam engine, continued to supply power until 1896, when it was finally abandoned. Coal had been won in connection with this mill, but it was not until 1868 that regular mining was

attempted on a commercial scale, and for several years the growth of the industry was slow, for although the coal produced here has always been cheaper than that from the northern and Illawarra fields, it is of rather inferior quality, and its principal use lies in raising steam.

But this coalfield has important advantages of position, since ores produced to the west must pass through it on their way to the coast, and it has proved more profitable to refine them here than carry them right to Sydney. The reverse is true with respect to wool and wheat, which go direct to the manufacturing and exporting centre, where there is a considerable local market for the finished articles. Copper refining began in 1874, although the greatest developments were in 1895, when the treatment of Cobar ores was begun and in 1900, when electrolytic refining was introduced. The growth of settlement and industry created a demand for bricks and pottery, which were made from clays derived from the coal measures from 1877 onwards; the working of iron began about 1875, but eleven years elapsed before the industry was placed on a sound footing and worked continuously. These movements of progress were assisted by industrial troubles in the northern (Newcastle) coalfield causing an increased demand for Lithgow coal, so that by 1890, although the town was still small, its mining and industrial activities were firmly established, and it might look forward to a period of growth and prosperity.

But this was not yet to be, for the coal production of the north again increased while depression, irregular trade and industrial unrest gave a severe setback to the Lithgow mines. The expansion of other industries was sufficient to hold the population, but no considerable growth took place until regular trade and industrial peace again prevailed.

The next forward step was the building of a new blast furnace, and the smelting of iron combined with increased coal production to establish a new high level of population which remained fairly constant until the beginning of the war, when the interruption of trade brought a greater demand for coal, metals, and later the small arms that were made in the town. The post-war boom saw further expansion, which was checked until more prosperous years returned, when a new maximum was attained in 1927. The management of the steelworks has since transferred its ore-smelting activities to Port Kembla and proposes to close the Lithgow works, but this movement has been partly offset by the further development of mining, especially during the stoppage on the northern field in 1929. The Railway Commissioners have extended the State coal mine, which is now responsible for a fourth of the production of the western field, and have established a central power house to supply electricity to the townships on the Blue Mountain Tableland (except Katoomba), and westward to Orange.

If we look at the population curve again, we are struck by its fluctuations in sympathy with coal production. It is true that part of the mining is carried on away from Lithgow and probably supports 1,000 or 1,500 people, but much of that development has taken place since 1925, and it explains part of the disparity between the graphs about that time. Lithgow is the workshop and industrial supplier of these outlying mines, some of their men live in the town, and many who have moved out from the main centre still retain their associations with it. As a generalization, we may state that one person is supported in Lithgow for each hundred tons of coal produced annually on the western field. Coal is the index of Lithgow's growth, and factors of national prosperity which affect it have a proportionate effect on the subsidiary industries, or the striking relationship of



the curves would not be shown. Such arbitrary factors as the closing of the steelworks would have the effect of lowering population per unit of coal produced, but if the total production increased, the population would tend to remain stationary.

During the past forty years coal mining has become relatively more important in the lives of the people: the graphs show production to rise above the population curve, and the taking away of an important industry will accentuate this relative increase. We may say, however, that the progress of manufactures has not kept pace with that of mining, for which costly haulage and the absence of a large market in the immediate vicinity are probably largely responsible. Lithgow is a coal mining centre with subsidiary industries, and the present unfavourable position of mining holds no promise of any immediate progress for the town.

#### *Nature of the Towns.*

We shall see presently that the pioneer settlers continue to use the natural resources of the land so far as possible, as in the construction of their homes, but the centres of population have been developed according to the original character and environment of their inhabitants. Lithgow is a typical urban area; isolated settlements have been established in branches of the valley about the principal coal mines, and have grown outward to meet one another on the main valley floor. Although there is a great expanse of level country nearby (Plate iii, fig. 1), the town is cramped into a small part of the valley, and is as thoroughly urbanized as the most densely populated parts of Sydney. This is the result of the gathering of what might be termed "town-minded people", although a few individuals whose employment lies in the town prefer to occupy larger holdings or small farms outside its boundaries (the "commuters" of American geographers). Portland and Wallerawang have shown the urban tendency in a slightly lesser degree, but the small outlying mining centres are conspicuous examples of it, where any number of people up to 200 may live on a few acres of land in the immediate vicinity of a large colliery in the midst of vacant fields.

The Blue Mountain towns have been modelled on suburban lines without any particular respect for site or contour. Most of them (like Lithgow) have grown without plan as the result of private subdivisions of land, and the effect of enclosed streets is to cut off all sight of the surrounding country until the cliff edges are reached. Katoomba is a conspicuous example of this, but throughout there is a tendency to line the main streets with ugly double-storied shops, and others with conventional suburban cottages. The nucleus of each settlement is (in the case of Glenbrook, was) the railway station: shops and hotels have been constructed in its vicinity, generally along the main road, which runs close to the railway. Streets have been built at right angles to the line, leading eventually to some beauty spot such as a ravine or waterfall, and have formed the main lines of settlement and, in the cases of Katoomba and Leura, of shops and business generally. Thus the essential plan of each township is in the form of a cross, of which one or other of the limbs may be askew or imperfectly developed, and on which a series of rectangles is constructed as land near the centre of development or along the main existing lines of expansion becomes alienated and built on. As the original land holdings were surveyed along meridional and transverse lines, there is a tendency for roads and settlement generally to parallel them. In

most cases this is a positive advantage, as the valleys trend in these directions in sympathy with underlying rock structure, thus making a "cross" plan inevitable. So far as the towns and villages themselves are concerned, the people have modified their surroundings to suit their own tastes and former environment, although an awakening of civic pride has caused the development of parks and gardens in the principal tourist resorts.

#### *The Upper Valleys.*

We have traced the development of settlements that have arisen apart from their surrounding countryside in response to special impulses. Turning now to the valley of Cox's River, we find that it falls naturally into three sections, which differ in altitude and are separated by areas of rough, unsettled country. These valleys may be distinguished by the titles "upper", "middle" (Kanimbla) and "lower", in which order we will treat them.

The upper valley and its branches penetrate the barren sandstone tableland, but their slopes rise southward to the Main Divide in the vicinity of Rydal. Alluvials of indifferent quality are found along the two main streams meeting at Wallerawang, while the country about that town and part of the land along Solitary Creek (flowing through Rydal) are clayey. Settlement has avoided the sterile higher tableland and has followed the valleys, which have been used as pasture land or, in small areas, for the growing of apples, oats, turnips and potatoes. Rural settlement is not continuous: the country north of Lidsdale has been abandoned, while the number of farmhouses about Wallerawang, Lidsdale, Blackman's Flat and Piper's Flat has not increased, although on the other hand there are a few more farms on the ridges southward, and on the level ground by Solitary Creek. Land which was cleared and used many years ago, and which was allowed to revert to its natural state, has been re-enclosed, cleared in parts, and cultivated in small patches. This process of re-occupation can be observed throughout the less desirable part of the Central Tableland, in country which was originally taken up during the intensification of settlement that preceded the opening of the great wheat producing areas of the inland slopes.

In the present case, the bleak and wind-swept country of the highlands has a poorish soil, and there is excessive moisture in the valleys during winter. The crops can only be disposed of with difficulty in the neighbouring towns, and they are generally forwarded to the central market in Sydney. At the same time, similar produce is brought from the metropolis and other distant centres to these very places! The few orchards in the tourist resorts have a like experience, which demonstrates the futility of present marketing arrangements, and condemns those who countenance such a system, for it is not only wasteful, but it helps to make the present absolute cleavage between the life and interests of the towns and those of the small rural communities near them.

Apart from the scattered population which we have just described, there are larger groups in the valleys. Wallerawang is the meeting-place of important roads and railways, and the centre for the outlying Newnes oil-shale field some 21 miles northward. Its population includes many railway employees and some miners, while nearby collieries at Lidsdale, Blackman's Flat and Angus Place have small miners' villages attached to them. Portland exists by reason of great cement works which exploit local limestone, clay and coal. These larger groupings occupy little space, and are artificial growths upon the countryside.

*The Middle Valleys (Kanimbla).*

A different picture is presented by the middle valleys of the Cox. They are flanked on the west by the high ridge of the Main Divide, whose western slope leads to the cleared granite hills of Fish River Valley, whose crest is partly occupied by occasional small farms, and whose forested eastern ridges lead down to the pasture lands of Kanimbla. That name is applied to the whole broad and partly dissected valley between the Main Divide and the sandstone tableland, whose precipices crown the sharp eastern rise.

Kanimbla Valley extends from Hartley in the north to Megalong (Creek) in the south, and is enclosed by higher land. Cox's River debouches from a gorge above Hartley and becomes entrenched in the valley floor, which it leaves by means of a deep canyon. The valley is thus cut in two by the river, and is only crossed readily in the vicinity of Hartley. Small settlements towards the west and south depend upon the roads along the Main Divide for means of communication, whilst those to the east and north have access to the tableland by roads surmounting breaks in the precipices at Hartley Vale, Mt. Victoria and Blackheath.

There is a deterioration of environment as one passes down the river; routes become more difficult and round-about as deep gorges make their appearance, and granites and undulating topography give place to the siliceous sediments and square outlines of a sterile region. In sympathy with this progressive alteration there is a regular change in the amount and type of settlement. Along the Main Divide between Rydal and Hampton, and again between that place and Hartley, a number of small farms have been established by the roadside at the heads of gentle valleys. These grow oats, potatoes, turnips and vegetables and rear a few sheep and cattle, but agriculture is the main resource, and the area of an individual farm rarely exceeds 40 acres. Passing from the forested eastern slope of the Divide into the valleys of the Cox and its western tributaries, cleared granite hills are observed which are almost entirely given up to sheep. They extend to the northern divide of Little River. Individual holdings are large and the homesteads are scattered, but there is some tendency towards grouping, and community centres may be established at convenient points. Thus Hampton has a store, churches, and a school, whilst the position of Lowther is marked by a church and a hall near the road, although there are only a couple of houses in the immediate vicinity. Most of the homesteads are situated in the level valleys, where a richer and moister soil enables small fodder crops to be grown to help feed the animals engaged in the working of the farms.

On the opposite side of the river the old town of Hartley has practically disappeared, since the reasons for its existence have gone. Likewise Hartley Vale has declined with the exhaustion of its kerosene-shale deposits and the abandonment of its oil refinery, although there has been a slight increase of population between it and Hartley as more land has been utilized for the growing of apples and peaches. Catering for tourists and holiday-makers provides another occupation of some importance.

Passing southward, a great stretch of country is comprised in one holding, the granite slopes being cleared, while most of the other land is too infertile to justify any attempt at use. Coming to Megalong Creek more farms are observed, devoted mainly to cattle and sheep, although a few have market gardens and apiaries, and those towards Blackheath cater for tourists. In passing, it is interesting to note the popularity of sheep in this valley, as Katoomba, only a few miles away, has an annual rainfall of 56 inches—about twice the optimum

for sheep. It is probable that the rainfall of the sheltered valleys is considerably lower than this, and the porous soil of the undulating valley floor is dry and healthy.

The settlement ends to the north of Galong Creek, although there is one house by that stream on the edge of the granites, which give the locality a small area of good pasture land. The history of that farm set in the midst of forest supplies a commentary on the boundaries of settlement in the wilder tablelands. The house is of wattle and daub roofed with iron, and the holding occupies a strategic position between the tableland on one side and the gorges of Galong Creek and Cox's River on the other. The trail to the lower Cox passes through it, so the holder commands the right of way, and is able to lease the inferior country to the south and depasture his stock on it without interruption from others, or risk of his ("annual") leases passing to competitors. The only stock on this country are cattle. A previous owner of the property tried sheep, but wild dogs destroyed many of them and the experiment failed. Apart from this, cattle are more suited to the timbered and dissected country, as they are more fitted to move between the scattered bits of pasture in the wilderness and to overcome the obstacles offered by tangled scrub. On the opposite side of the Cox in the valleys of Little, Jenolan and Kanangra Rivers there is no settlement: a couple of pioneer farms started on the inadequate areas available have been long abandoned, and the country is only penetrated by occasional prospectors or walking parties.

The occupation of the southern end of Kanimbla Valley has been marked by a few outstanding incidents. Although much of the country was taken up before the beginning of this century, clearing and settlement were first confined to the vicinity of Hartley or of the Jenolan road. The country about Megalong Creek was ringbarked by aborigines in 1905, and there was a prolific first growth of grass. In the following summer the valley was swept by a great fire, which was followed immediately by an invasion of rabbits—a succession of events which ruined much good pasture land. The destruction of surface vegetation combined with the burrowing of rabbits and with overstocking to make the light soil very susceptible to erosion, and much of it was swept into the river, leaving poor clays or rock slopes on the steeper hillsides. As a consequence the river gradually silted up, and year by year the lower course has been encroached on by sand, until at the present time only the last five miles above its junction with the Wollondilly River retain their original depth and appearance.

For many years these generally adverse conditions prevailed, and a number of the "frontier farms" on the edge of settlement were abandoned (Plate iii, fig. 2). Some efforts were made to cope with the rabbit plague by trapping and poisoning and by the destruction of warrens, but in most cases these were ineffective owing to the amount of rocky country, fallen timber and bracken available for cover, and to fresh incursions from neglected paddocks. However, there was some benefit in post-war years, when an increasing demand for rabbit skins caused an influx of trappers during the winter months, and the landholders themselves were not slow to benefit by this new source of revenue. Some of them, indeed, came to be known as "rabbit farmers", for while they complied with laws relating to the systematic destruction of the pest, they did not interfere with its breeding. But the majority of holders were sincere in their efforts, and by the end of the winter of 1926, aided by a considerable number of men attracted by the high prices offering for furred skins, they had got the plague under control, although rabbits have been eliminated only from those holdings which are

enclosed by vermin-proof fences. These places have recovered rapidly, and their uniform turf contrasts with neighbouring holdings which are still rabbit infested and overstocked, and on which there is only an irregular growth of poorer grasses, with many bare places on the hillsides.

Settlement of the middle valley, then, has been restricted by physical difficulties and areas of poor soil. Extensive destruction of the land has followed in the wake of settlement, although this can be remedied even now. The permanency of the main streams has not been greatly affected, as much of their water comes from swamps on the higher tableland.

#### *The Lower Valleys.*

Continuing down the Main Divide south of Hampton, the tourist resort of Jenolan Caves is passed, and small settlements are found of a type similar to Hampton. The one exception is Mt. Werong, where a few men find employment in prospecting for gold and minerals; this is typical of the old alluvial workings from which all of the easily obtained wealth had been extracted before the end of last century, but which are still occupied by a few old men who have no other means of livelihood, or by others who would rather eke out a precarious existence in such a place and hope for sudden wealth than engage in regular and monotonous work in towns or on farms. There is no settlement in the nearby Kowmung valley, and of the half score of farms originally found in the valley of Jamieson's Creek and on the neighbouring portion of Cox's River, only half are now occupied. The infertility of the greater part of these valleys combines with rough topography to give this result. In addition, the enclosed valleys are very hot in summer, and in the Kowmung district the water supply is poor, with the exception of the river itself flowing in a deep gorge. The slopes to Cox's River from the Kowmung divide and part of the floor of Jamieson's Valley are used for grazing cattle, with a few sheep and goats near one or two of the homesteads. Occupation was originally effected from more attractive country to the east in the deep lower valleys.

These easterly valleys (Plate iii, fig. 3) are relatively narrow trenches in the sandstone tableland, and their sides are surmounted with cliffs. Those occupied by the Cox and Wollondilly have flood plains or bottoms of fine brown silt, which is easily worked and is very fertile. The material has been brought down from granite and clay lands, but minor streams flowing in the horizontal rocks have only limited sandy flats, which are not inhabited in parts of their courses. Farms are dotted along the productive river flats, and while terraces above the flood limit are cultivated, the slopes to the river banks and the better parts of the hill bases are lightly grassed, and are used directly as pasture. The greater part of the settlement is found by the Wollondilly above its junction with Nattai River, for here the valley opens out and the good land becomes more extensive. As a rule, the single road line which serves the farmers is clear of the richer ground, and keeps to the bases of the slopes or to sandy parts of the lower river terraces.

The only ready means of access is by road from Camden, which enters the valley by way of a pass cut in the sides of the cliffs. It replaces the original steep zig-zag road which served the earlier settlers, or the still older road to Nattai River; but even now transportation is costly, and maize grown on the bottom lands is fed to pigs or cattle, which are taken to market in Camden by motor trucks. There are also a few apiaries, dairies, market gardens and orchards,

while the slopes to the south of Tonalli River support sheep. In the wilder Kowmung district these animals are liable to attack by wild dogs and would be difficult to locate on the broken, scrubby hillsides, so their place is taken by cattle.

The aspect of the valley settlement has changed greatly since its inception, and an early maximum of population has been followed by conditions of stagnation or decline, the figures for 1891 and successive decennial census years being 531, 492, 491, and 396 in 1921. (These figures include 80 people for Cox's River in 1911 and 67 in 1921. That settlement had previously been omitted altogether.) At first, the settlers were practically isolated from the rest of the world and lived a life of their own, producing their food and a sufficient surplus to exchange for tools and manufactured goods necessary for life. Many of the holdings were small: some are not occupied at the present day, and others have been amalgamated. The first houses were built of slabs and were roofed with bark or iron, and the whole tendency of the settlement was to produce a backward type of people, who are found in parts of the valleys to the present day.

With the opening of the silver mines at Yerranderie about the beginning of this century, intercourse with the outside world became freer, although the settlement along Cox's River remained especially isolated. A new market was provided for portion of the valley's produce, and some of its people went to work in the mines. About this time, brick and sawn-board houses began to replace the original structures, but there was no increase of population. The reason for this is best sought, perhaps, in social conditions, for with maize as the staple crop the full potentialities of the valley have never been exploited, and there is no apparent deterioration of the country. While the farmer was satisfied to make a bare living from his holding and to live to himself, he remained on his farm; but when the idea of high wages, short hours of labour and the possession of money to spend as they pleased attracted his children, they moved into the towns, and became artisans or labourers for the most part. Some of the people found their way to the Blue Mountain towns, and others to the Camden district or to the city.

But there were others who were unwilling to follow this course, and they struck out into new country. The hillsides between Yerranderie and the Wollondilly River were further selected and cleared, while the strip of country between Black Hollow Creek and Kowmung River was selected and surveyed during the first five years of this century. A quantity of cedar (*Cedrela toona*) was won from the wild slopes to the west of that river, parts of the gentler slopes were cleared, and a few small homesteads were established on the ridge between the streams. These were unsuccessful; the frontier of permanent occupation retreated to the vicinity of Cox's River and Yerranderie, and the few people who had settled in the deep valleys between Black Hollow Creek and the Wollondilly River were also unable to hold their ground. At present, this country is held by people living in the valley settlements, and it supports a few cattle which roam along the small grassy flats in the deep Kowmung gorge, or on the hills and slopes of the other alienated country. A similar state of affairs exists on the high tableland south of Jenolan and in the rougher part of the Tuglow drainage, where land selected in the early years of this century has almost been abandoned. In all cases the wilder territory has never been effectively occupied.

With the decrease of population in the valley settlements, the size of individual holdings tended to increase, although some were given up. The coming of motor

transport finally did away with the old isolation, although its influence is still seen in the Cox's River settlement, where communication is hindered by deep fords. An influx of tourists has caused many of the farmers to depend less on their holdings and more on catering for visitors, thus giving the lower part of the valley the appearance of a regular tourist resort with motor camps and small dwellings for occasional occupation. But, apart from this, the community has changed from one which provided most of its own necessities to one which depends upon the outside world even for such things as meat and bread, and whose activities are directed to the production of a few crops for outside markets.

We have mentioned Yerranderie in passing. Mining first began about 1892, and the respective populations for 1901, 1911 and 1921 were 100, 840 and 350, and there has probably been little change in subsequent years. The value of silver produced has been considerable, but the village has suffered the vicissitudes of its type, generally due to industrial troubles, but on occasions to a lowering of the price of silver making mining unprofitable. Although there is daily motor communication with Sydney, Yerranderie is virtually isolated, and the miners, shut in by their barren hills, live to themselves. The partly-refined ores pass to Sydney, which supplies most of the necessities of life. Prevailing industrial conditions have caused the closing of the mines, and the future existence of the village is a matter of doubt.

These conditions and movements, while remarkable in themselves, are still more noteworthy when it is remembered that they have developed within 60 miles of a great capital—the second largest city in the southern hemisphere!

#### *Communications. Text-fig. 2.*

We have seen that the mass of settlement has come into being with the railway, and has clung to the original route across the tableland. Apart from this, the more productive soils have been used for pasturage or agriculture, and occasional waves of settlement have penetrated the more broken country, only to retreat and leave a few wandering stock as evidence that the land is owned by people in more favourable parts.

The lines of communication were determined in the first place by physical features, which are such a barrier to free intercourse between the coast and the interior that the main road and railway through the Blue Mountain towns are the only important through routes between the Hunter valley in the north and Goulburn in the south—a distance of 140 miles. There is, indeed, only one other route of any note, namely, the mountain road across the Wollondilly River and past Wombeyan Caves, immediately to the south of this area. Meridional gorges to the north and south are separated by the gentle ridges forming the watersheds of Grose River, which can be likened to bridges across otherwise impassable country.

The first main road (Cox's) was built in 1815, and followed a steep course to the south-west from Hartley to cross the Main Divide, whence it passed in a more northerly direction to Bathurst. Lockyer's road crossed the Cox some miles higher up, and followed the valley of Fish River to Bathurst, but it was replaced by Sir Thomas Mitchell's line, which used a gentler route from the tableland at Mt. Victoria, and took the shortest way across the highlands to the north of Rydal and Fish River. This remains the highway to the present day, although recently (1929) a more level road was built to head the gorge of the Cox and to pass by

Wallerawang to Mitchell's road near Rydal. The eastern end of the road had also been improved by the selection of a gentler route at Glenbrook, and in the case of the railway line, the original zig-zags at Glenbrook and Lithgow have been replaced by contour railways and tunnels. There has been a continual endeavour to improve these arteries of commerce, and to mitigate the difficulties offered by the tableland.

In other parts of the area, however, there is a steady degeneration in the means of communication. About the head of Cox's River, roads follow the gentle valleys or water partings between tributary streams, and continue by the ridges into more broken country. In places, important roads cross deep valleys: that through Jenolan Caves owes its existence to the attractions of the caves, while the road between Camden and Yerranderie serves the valley farmers and miners; but on account of the difficult terrain which they traverse, and the fact that they do not belong to the network of ways between large centres of population, these cannot be regarded as other than specially developed local roads. The natural route to the lower Cox and Wollondilly via Warragamba River has not been utilized—partly on account of the rough nature of the gorge, but more especially because the existing road links the great majority of its users to the nearest railhead.

Coming towards Kowmung River from any direction, roads to serve outlying settlers become rougher and more difficult, and finally end in trails which can only be traversed on foot or on horseback. Although these serve some purpose in the movement of stock, they emphasize the natural difficulty and unproductiveness of the country through which they pass, and contrast with the highly-developed roads and railway which serve the towns immediately to the north. This quick change from advanced conditions to those of a primitive nature corresponds with the changing types of life and occupation of the people, and the various sections of the community may be enumerated in distinct classes as: the people of the tourist towns; those of the mining and manufacturing centres; the farmers of the upper and lower valleys; those of the middle valley; and, finally, the people who do not live permanently in the locality. This latter type includes graziers who spend part of their time with stock in the wilder country; rabbit-trappers, whose occupation is limited to winter, and prospectors, who move from place to place in the rough highlands in search of gold and minerals.

#### *Future Development.*

Taken as a whole, the area is as highly developed as it will be for many years to come. The growth of the towns is not being maintained, and the rural population has adjusted itself to the country so that, without an entirely different type of settlement, there is no probability of a considerable increase of population in the more sparsely-settled districts.

There are two assets of great potential value—coal and water. Coal outcrops continuously between Lithgow and the eastern hills of the Wollondilly, and although the quality is inferior in parts of this line, the value of the asset as a whole must increase as the more accessible coal is won from Lithgow district. The easterly outcrops are more favourably situated with respect to Sydney than is Lithgow, as the distance from the lower end of Burragorang Valley to the metropolis (via Warragamba River and Penrith) is 63 miles as against 97 miles from Lithgow, and in addition the former route is level, while the existing railway



has to surmount the tableland. So the coal measures of the lower valleys may be looked on as a valuable reserve, although a small mine now beginning to operate above the junction of the Wollondilly and Nattai Rivers is premature.

As regards water, it has been proposed to utilize this by throwing a dam across the Warragamba River immediately above its junction with the Nepean. The water impounded would stretch back to Jamieson's Creek and Nattai River, flooding the river terraces in that section. The great objection to the proposal lies in the presence of large towns within the catchment—Goulburn, Moss Vale and Bowral to the south, and Lithgow, Katoomba, and others of the Blue Mountain towns to the north. Water from the larger towns would need special purification before being stored, but this is considered to be practicable. If the growth of the metropolis continues, such a scheme may be warranted, but in any case nothing is to be gained by further deforestation in the catchment area, to which practice some settlers appear to be inclined.

In conclusion, it may be remarked that the Blue Mountain Tableland has many features in common with the remainder of the State's highlands. The existence of great undiscovered possibilities is unlikely, and the future of the country lies in the systematic exploitation of known wealth. When it is economically possible, this involves the development of low-grade mineral deposits, more intense cultivation in agricultural areas, and a greater growth of fodder crops in pastoral regions (one form of the latter is the cultivation of natural pastures). So far as this area is concerned, the backward conditions that we have noticed in its less accessible parts may continue almost indefinitely, despite their nearness to the great complexity of modern towns and cities.

[*Postscript.*—The information embodied in the foregoing was collected mainly during 1926, when the writer was an Honours student under Professor Griffith Taylor, and Caird Scholar in Geography at the University of Sydney. The text, maps and diagrams are new.]

#### EXPLANATION OF PLATE III.

1.—Lithgow Valley. The industrial town is spread along the narrow valley in the background, and is expanding into the grazing lands. Note the barren tableland.

2.—An abandoned outpost of settlement, Little River. Note the pioneer hut, the garden clearing, and the hill-slopes used for pasture.

3.—Lower valley of Cox's River, to show the cultivated bottom lands, grazing country at the foot of the slopes, and the difficulty of communication in the broken highland.

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